Calibration Requirement for Clean Wavefront Recombination with Internal Beam Amplitude Monitoring - ie, FLUOR

- Instrument visibility transfer factor
  - Mild requirement
  - Slowly varying
  - *Not* seeing dependent
  - *Not* zenith distance dependence
  - Small set of calibrator stars suffices

Introductory Remarks on Calibration

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Calibration Requirement for Dirty Wavefront Recombination

- Instrument
- Atmosphere
  - Severe requirement
  - Telescope shake - f_{res}
  - Tilt - D/v_{wind}
  - Speckle - r_o/v_{wind}
  - Seeing - f^{-a}
- Not calibrated directly, but indirectly

Atmosphere Calibrator Requirements

- Assume that atmosphere contributes 10% of visibility variability.
- Atmosphere varies as powers of sec(Z).

Estimate Number of Calibration Stars Required for 4π steradians		
Zenith Distance	5% Calibration	1% Calibration
30^o	~60 stars	~300
60^o	~200	~900

- Different calibrator set for different baseline, wavelength.

Calibrator Strategies

- Case by case selection based on existing archive data.
- Pre-selection of qualified stars to provide a vetted list.
- On-sky verification of pre-selected list.

Meudon Calibrators (Pascal Borde)

- Cohen list of standard stars.
- Angular diameters based on streamlined model fitting process based on archival data.
- List filtered for binaries, etc.
- Proven in practice to of order few percent.

Difficulties with Real Stars

- Real stars often (usually?) don’t fit simple models.
- Apparent size varies with wavelength
- Dependence on rotation, surface structure, luminosity, mass loss.
- Dependence on abundances,……

For High Quality Visibility Calibration

- Intercompare multiple calibrators on each program for internal verification - implied study of each calibrator.

Interferometry Roadmap

- Science with existing arrays
  - Demonstrate success to
    - Our colleagues
    - Our funding agencies
    - The broad community
- Stellar imaging (surface/chromospheric/circumstellar)
  - Existing small/medium arrays
  - Many telescope, long baseline, high spectral resolution, extreme bootstrapping
- Compact faint source imaging (AGN, gal. nucl., interacting binaries)
  - VLT, Keck, OHANA
  - Large apertures, large baselines
- Deep wide field imaging
  - EG, 20-20 (proof of concept)

Interferometry timeline

- 2006 - publications of stellar surface imaging results - good UV coverage, extreme bootstrapping
- 2007 - publication of faint source interferometry results - AO supported
- 2008 - Draft proposal to study next generation interferometer